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EXAMINER	
BEHNCKE, CHRISTINE M	
ART UNIT	PAPER NUMBER
3661	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No.	Applicant(s)	
	10/734,616	KURZWEIL, RAYMOND C.	
	Examiner	Art Unit	
	CHRISTINE M. BEHNCKE	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *Non patent literature (1)*.

DETAILED ACTION

This office action is in response to the Amendment and Remarks filed 1/25/2010, in which claims 1-21 were presented for examination.

Response to Arguments

Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simmons, US 6,741,911, in view of McIntosh, US 5,103,404, in further view of Rosenberg, "'Virtual fixtures': Perceptual overlays enhance operator performance in telepresence tasks" Stanford University, Stanford, CA, August 1994.

(Claims 1 and 13) Simmons describes a virtual reality encounter system and method comprising: a humanoid robot having tactile sensors positioned along the exterior of the robot (column 8, lines 39-50), the sensors sending tactile signals to a communications network (column 7, lines 29-32); and a body suit having tactile actuators (column 6, lines 33-51, column 8, lines 39-50), the actuators receiving the tactile signals from the corresponding tactile sensors on the robot from the communication network (column 7, lines 29-32), wherein the tactile sensors and the corresponding tactile actuators are calibrated in connection with variable sensitivities associated with different regions of the human (column 8, line 62- column 9, line 4,

column 13, lines 3-28). Further McIntosh teaches that it was well known in the remote robotic control art to calibrate sensors to different levels of sensitivities to overcome the problem and allow, according to McIntosh, individuals to vary the sensitivities of tactile feedback to optimize their own degree of sensitivity and control over the manipulator (column 1, lines 41-50, column 9, lines 12-52). It would have been obvious to one of ordinary skill in the art at the time of the invention to calibrate the tactile actuators of the body suit, because as McIntosh suggests this would allow the user to preset and vary the sensitivities of the suit actuators in individual body locations to the user's preferred degree of sensitivity of how to feel the remote environment. This would as Simmons suggests, allow the user to feel pressure or force that is proportional to the robot at remote locations (column 40, lines 39 -45), allowing the user's hands to feel more delicate level of sensation or allowing the user to feel superhuman, by feeling only a little of a large force (column 40, lines 19-64).

Simmons further describes the user apparatus overlays supplemental tactile sensations from stored virtual tactile sensations that are sent to the body suit (column 8, line 62-column 9, line 4, and column 12, lines 56-65) in the form "[user] feels the rocks holding him up and the wind shaking his body" in a virtual world that does not exist. Rosenberg teaches the use of perceptual overlay in a telepresence system. Rosenberg defines perceptual overlay as "abstract sensory information overlaid on top of the reflected sensory feedback from a virtual, remote, or real environment... perceptual overlay may be composed sensory information ... including visual, auditory, **haptic, and tactile sensations**" (pg 11, section 1.8, lines 1-7). Further, "perceptual overlays are in fact

virtual constructs, and **not** truly a part of the distal environment, perceptual overlays can be seen as embellishments of the user's perceptual reality" (pg 12, lines 1-2). The telepresence system includes a remotely controlled robot having force sensors (MERLIN robot arm, located in the "remote environment"); an exoskeleton having force actuators (FREFLEX upper body exoskeleton, located in the "operator space" . . . "where the human subject is interfaced to the system", figure 5.1, pg 122 and the tested embodiment of a force reflecting joystick, pg 172), a microprocessor located at the operator space connected to the user interface exoskeleton and/or joystick (pg 77 and tested as Intel-486 computer, section 7.1.1, pg 172); inherently a microprocessor comprises a memory; the computer comprising a software package to be executed by the computer, the software configured to: retrieve data for generating supplemental virtual tactile sensation signals (virtual fixture models computed by MERLIN VME, fed to the FREFLEX VME controller, section 5.4.4, pg 133) the processor generated the supplemental virtual tactile signals from the corresponding tactile sensors with the generated supplemental tactile sensation signals (section 5.4.4.2-5.4.4.5, the fixture models were composed of viscous damping calculations, which was used to determine the resultant force to be applied to the exoskeleton); and send the overlaid tactile signals to the body suit (the calculated force is sent to the FREFLEX VME controller to be implemented on the exoskeleton). Rosenberg further teaches that the virtual fixtures may be implemented by the user by using a software package, Percept-Station, that includes a retrievable computer-program "toolbox" of virtual fixture models (abstract perceptual elements), that the user may overlay on the perceived remote environment

by using associated keystrokes and menu options (pg 171, lines 14-33). It would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of Rosenberg to the virtual reality system of Simmons in view of McIntosh because as Rosenberg suggests "by overlaying particular configurations of perceptual information on top of the reflected sensory feedback from a telepresence worksite, operator performance can be greatly enhanced in a variety of manual tasks." (Pg 12, lines 8-10.)

Rosenberg does not describe the operator's computer that overlay the virtual fixtures as a "gateway device". However, it was well known in the computer arts that a gateway can be embodied in a general computer to perform the protocol conversion or the functions that a separate gateway device (such as a router or modem) performs. It would have been very obvious to one of ordinary skill in the communication arts to utilize a general computer with an internal gateway device (internal router or modem) as the operator's computer which overlays the virtual fixtures, as this would have been merely a design choice of the network system, comprised of well known network components.

(Claims 2 and 14) Simmons further describes motion sensors positioned throughout the body suit (column 13, lines 50-67), the motion sensors sending motion signals corresponding to movements of each sensor relative to a reference point (column 14, lines 30-41), the motion signals transmitted to the communications network (column 7, lines 29-32); and the humanoid robot, receiving, from the communications network the signals from the motion sensors (column 11, lines 15-60), the signals from

the motion sensors causing a movement of the robot that is correlated to a movement of the body suit (column 8, lines 23-30).

(Claims 3 and 15) Simmons further describes wherein the robot includes actuators corresponding to the motion sensors, the actuators causing the robot to move (figure 2).

(Claim 4) Simmons describes the robot comprising a body (column 5, 40-58); a camera coupled to the body, the camera for sending video signals to the communications network (column 7, lines 2-8, column 11, lines 51-52); and suggests sending audio information to the local site over the communications network (column 11, lines 51-52) further describing that a sound sensor means is coupled to second body (robot) to capture sound for sending audio signals to the communications network (column 4, lines 20-28 and claim 49).

Claim Rejections - 35 USC § 103

Claims 5, 8, 9, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simmons in view of McIntosh, and Rosenberg as applied to claims 4 and 14 above, and further in view of Simmons US 20030030397 (Simmons '397).

(Claims 5, 8, and 16) Simmons describes wherein the user wears a "wrap around video display or a holographic display over his eyes" to render the video signals received from the camera (column 9, lines 5-10) and a transducer to transduce the audio signals received from the sound sensor coupled to the robot (claim 49, column 4, lines 20-28). Simmons '397 teaches that the robot would comprise microphones in the appropriate ear location to be relative to the ear position of the user (claim 19) and that

the head display would comprise of goggles or glasses (claim 12). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Simmons '397 with the invention of Simmons, in view of McIntosh and Rosenberg, because as Simmons '397 suggests, the microphones and the goggles are one well known means of creating the 360-degree, stereoscopic, realistic feedback of the remote location ([0016]). Simmons further describes wherein the virtual reality system comprises an interface having one or more channels configured to receive the audio signals form the sound sensors (column 7, lines 29-32); receiving the video signals form the camera (column 7, lines 2-8); sending the video signals to the head display (column 9, lines 5-10); and sending the audio signals to the sound producing means (column 4, lines 20-28).

(Claims 9 and 18) Simmons further describes wherein the body includes an eye socket and the camera is positioned in the eye socket (column 7, lines 2-8).

Claim Rejections - 35 USC § 103

Claims 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simmons in view of McIntosh, Rosenberg and Simmons '397 as applied to claims 5 and 16 above, and further in view of Algazi, US 7,333,622.

Simmons and Simmons '397 describe wherein the sound sensor is positioned on the robot relative to the position of the sound receiver on the person and can be refined by the shape of the outer ear (column 4, lines 20-28). Algazi teaches it was well known in the art to place listening devices in a mannequin having the exact size, shape, and acoustic properties of the listener located in the ear canals to replicate the sound

signals accurately (column 3, lines 22-52). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Algazi with the invention of Simmons in view of McIntosh, Rosenberg and Simmons '397 because Algazi describes merely one means of achieving the result described by Simmons of replicating the 360 degree, precise audio feedback to the remote user.

Claim Rejections - 35 USC § 103

Claims 6, 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simmons in view of McIntosh, Rosenberg, Simmons '397 and Yee as applied to claims 5 and 16 above, and further in view of Abbasi, US 6,786,863.

Simmons describes a remote robot operating system and method wherein one user controls a robot that duplicates the actions of the operator and transmits the sensed condition of the robot environment to the operator, wherein the sensed environment is overlaid visually and reproduced by actuators and sensors on the operator (column 1, line 36-column 2, line 12). Simmons does not describe wherein at the location of the operator, a second humanoid robot transmits data to a first location. However, Abbasi teaches this duplication of the same system to create an interaction between remote users is known. Abbasi teaches a remote physical contact system and method wherein a first surrogate (robot) is at a first location, a second surrogate (robot) is at a second location, the second surrogate having the same components, actuators, and sensors, i.e. a second microphone and second camera (figure 1, elements 35B, 40B, and 45B); a second display to receive the video signals from a first camera, a second earphone to receive audio signals from a first microphone (figure 1, elements 25

and figure 6), and a first gateway device in the first location and a second gateway device having a processor in the second location to create the remote interaction via a network (computer network 30 between computers 15 and 25, figure 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Abbasi with the invention of Simmons, in view of McIntosh, Rosenberg and Simmons '397, because as Abbasi teaches the use of remote surrogates and expands the notion by using dual surrogates for teleconferencing or computer communications, adding a capability to engage in all types of physical contact to "provide for the tactile sensation so inherent in many forms of human contact." (Column 1, lines 44-64.) Further the combination of the prior arts would produce a predictable result by merely duplicating the known systems and interchanging the physical locations, as clearly suggested by Abbasi.

Claim Rejections - 35 USC § 103

Claims 11, 12, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simmons in view of McIntosh, and Rosenberg as applied to claims 5, Simmons in view of McIntosh, Rosenberg, and Algazi as applied to claim 10, and Simmons in view of McIntosh, Rosenberg, and Simmons '397 as applied to claim 16, further in view of Yee, US 6,016,385.

Simmons in view of Simmons '397 describes transmitting video signals to a set of goggles but does not specify a receiver or that the data is transmitted wirelessly. However, Yee teaches a headset of a user comprises a receiver to receive video signals (column 5, lines 11-37) and wherein the robot comprises a transmitter to

wirelessly send the audio, tactile, motion and video signals to the communications network (communications antenna 30). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the invention of Simmons in view of McIntosh, Rosenberg and Simmons '397 with the teachings of Yee because it was well known that wireless means would offer the predictable result of more accessible travel of the robot and a wider range of motion.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE M. BEHNCKE whose telephone number is (571)272-8103. The examiner can normally be reached on 8:30 am- 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CMB

/Thomas G. Black/
Supervisory Patent Examiner, Art Unit 3661